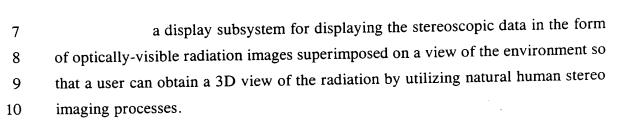
6

data; and

## WHAT IS CLAIMED IS:

i	1. A method for high-speed, 3D imaging of optically-invisible
72	radiation, the method comprising:
$\frac{1}{3}$	detecting optically-invisible radiation within an environment to obtain
4	signals;
5	processing the signals to obtain stereoscopic data; and
6	displaying the stereoscopic data in the form of optically-visible
7	radiation images superimposed on a view of the environment so that a user can
8	obtain a 3D view of the radiation by utilizing natural human stereo imaging
9	processes.
1	2. The method as claimed in claim 1 wherein the environment is
2	a virtual environment.
1	3. The method as claimed in claim 1 wherein the environment is
2	an optically-visible environment.
1	4. The method as claimed in claim 1 wherein the radiation is
2	ionizing radiation.
1	5. The method as claimed in claim 4 further comprising
2	energizing material so that the material emits or deflects the ionizing radiation.
1	6. The method as claimed in claim 1 wherein the radiation is
2	infrared radiation.
	\
XP	7. A system for high-speed, 3D imaging of optically-invisible
27	radiation, the system comprising:
3	a detector subsystem for detecting optically-invisible radiation within
4	an environment to obtain signals;
5	a signal processor for processing the signals to obtain stereoscopic

1



- The system as claimed in claim 7 wherein the environment is 8. 1 a virtual environment. 2
- The system as claimed in claim 7 wherein the environment is 9. 1 an optically-visible environment. 2
- The system as claimed in claim 7 wherein the radiation is 10. 1 2 . ionizing radiation.
- The system as claimed in claim 10 further comprising means 11. 1 for energizing material so that the material emits or deflects the ionizing radiation. 2
- The system as claimed in claim 7 wherein the radiation is 12. 1 infrared radiation. 2
- The system as claimed in claim 7 wherein the detector 13. 1 subsystem includes a set of field or area detectors. 2
- The system as claimed in claim 7 wherein the detector 14. 1 subsystem includes a set of point detectors. 2
- The system as claimed in claim 7 wherein the detector 15. 1 subsystem includes a set of passive detectors. 2
- The system as claimed in claim 7 wherein the detector 16. subsystem includes a set of active detectors. 2

3

4

1

2





1	17. The system as claimed in claim 13 wherein the radiation is
2	gamma-ray radiation and wherein the set of field detectors includes a pair of gamma-
3	ray or other positional radiation detectors.
	•
1	18. The system as claimed in claim 17 wherein the gamma-ray
2	cameras are scanning gamma-ray cameras and wherein each of the gamma-ray

- cameras are scanning gamma-ray cameras and wherein each of the gamma-ray cameras is capable of scanning the environment through a plurality of angles and wherein the signals are processed to locate a source within the environment.
- 1 19. The system as claimed in claim 7 wherein the radiation is 2 ionizing radiation and wherein the detector subsystem includes a scintillator and a 3 collimator for directing the ionizing radiation into the scintillator.
- 1 20. The system as claimed in claim 19 wherein the scintillator is 2 curved.
- 1 21. The system as claimed in claim 7 wherein the detector subsystem includes a compound eye detector.
  - 22. The system as claimed in claim 21 wherein the compound eye detector includes a plurality of individual detectors.
- 1 23. The system as claimed in claim 22 wherein the plurality of individual detectors are movable independently or as a group.
- 1 24. The system as claimed in claim 21 wherein the compound eye detector includes a single detector movable in three dimensions.
- 1 25. The system as claimed in claim 14 wherein the signal processor processes the signals to obtain a 3D map of radiation-emitting sources.
- 1 26. The system as claimed in claim 7 wherein the detector subsystem has stereoscopic capabilities.



1	27. The system as claimed in claim 7 wherein the detector
2	subsystem is portable.
1	28. The system as claimed in claim 7 wherein the display
2	subsystem includes a see-through display subsystem and wherein the system further
3	includes a tracking system for tracking the display subsystem.
_	
1	29. The system as claimed in claim 28 wherein the display
2	subsystem is head-mountable.
1	30. The system as claimed in claim 7 wherein the system provides
1	real-time visual feedback about location and relative strength of at least one
2	· · · · · · · · · · · · · · · · · · ·
3	radiation-emitting source.
1	31. An ionizing radiation detector comprising:
2.	an ionization substrate for converting ionizing radiation into a signal;
3	a converter coupled to the substrate for converting the signal into a
4	corresponding electrical signal; and
5	a positioner for moving the substrate in three dimensions to image
6	over a surface of a sphere.
1	32. The detector as claimed in claim 31 wherein the substrate is
2	a scintillator for converting ionizating radiation into photons of light.
1	33. The detector as claimed in claim 32 wherein the signal is an
2	optical signal and the converter is a photodetector.
1	34. The detector as claimed in claim 32 wherein the signal is an
2	optical signal and the converter is a multiplier phototube.

1	35. An array of detectors wherein each of the detectors is a
2	detector as claimed in claim 31 and wherein the detectors are arranged in a
3	curvilinear geometry.
1	36. The array as claimed in claim 35 wherein the detectors are
2	arranged so that the array forms a substantially hemispherical device.
1	37. The array as claimed in claim 35 wherein the substrates of the
2	detectors are formed from separate materials.
1	38. An ionizing radiation detector comprising:
2	an ionization substrate formed from a single material and having a
3	curved first surface and a second surface opposing the first surface for converting
4	ionizing radiation at the curved first surface into a signal; and
5	a radiation shield disposed at the second surface to substantially block
6	ionizing radiation at the second surface.
1	39. The detector as claimed in claim 38 wherein the radiation
2	shield is a fanned collimator.
1	40. The detector as claimed in claim 38 wherein the ionization
2	substrate is a curved scintillator for converting ionizating radiation into photons of
3	light.
1	The detector as claimed in claim 38 wherein the ionization
2	substrate is a semiconductor substrate.
1	42. The detector as claimed in claim 38 wherein the detector forms
2	a substantially hemispherical device.
1	43. The detector as claimed in claim 38 wherein the second surface

is curved and is substantially parallel to the curved first surface.